

We claim:

1. A golf ball comprising nanocomposite material, wherein the nanocomposite material comprises a polymer having a structure in which particles of inorganic material are reacted and substantially evenly dispersed, wherein each particle has a largest dimension that is about one micron or less and that is at least an order of magnitude greater than such particle's smallest dimension.

2. A golf ball as defined in claim 1, wherein the polymer is selected from the group consisting of polyamide, ionomer, polycarbonate, polyurethane, polystyrene, fluoropolymer, polyamide elastomer, polyester elastomer, polyester, polyolefin, thermoplastic elastomer, thermoplastic vulcanizate, and epoxy resin, and mixtures thereof.

3. A golf ball as defined in claim 1, wherein the particles of inorganic material consist essentially of clay.

4. A golf ball as defined in claim 3, wherein the clay is selected from the group consisting of hydrotalcite, montmorillonite, micafluoride, and octosilicate.

5. A golf ball as defined in claim 1, wherein:
the golf ball comprises a core; and
the core comprises nanocomposite material.

6. A golf ball as defined in claim 5, wherein the core comprises about 1 to about 50 percent by weight nanocomposite material.

7. A golf ball as defined in claim 6, wherein the core comprises about 1 to about 40 percent by weight nanocomposite material.

8. A golf ball as defined in claim 7, wherein the core comprises about 5 to about 30 percent by weight nanocomposite material.

9. A golf ball as defined in claim 1 wherein:
the golf ball comprises a core and a layer surrounding the core; and
the layer comprises nanocomposite material.

10. A golf ball as defined in claim 9, wherein:
the golf ball comprises a cover layer on an outer surface of the golf
ball; and
the cover layer comprises nanocomposite material.

11. A golf ball as defined in claim 9, wherein:
the golf ball comprises a cover layer on an outer surface of the golf
ball and an intermediate layer or layers situated between the core and the cover
layer; and
one or more of the intermediate layer or layers comprise
nanocomposite material.

12. A golf ball as defined in claim 9, wherein the layer comprises about 1 to about 50 percent by weight nanocomposite material.

13. A golf ball as defined in claim 12, wherein the layer comprises about 1 to about 40 percent by weight nanocomposite material.

14. A golf ball as defined in claim 13, wherein the layer comprises about 5 to about 30 percent by weight nanocomposite material.

15. A golf ball as defined in claim 1 wherein:
the golf ball comprises a core, a layer of rubber thread encasing the core, and a cover layer encasing the layer of rubber thread; and
the core comprises nanocomposite material.

16. A golf ball as defined in claim 1 wherein:
the golf ball comprises a core, a layer of rubber thread encasing the core, and a cover layer encasing the layer of rubber thread; and
the cover layer comprises nanocomposite material.

17. A golf ball comprising nanofiller material, wherein the nanofiller material consists essentially of particles of inorganic material, wherein each particle has a largest dimension that is about one micron or less and that is at least an order of magnitude greater than such particle's smallest dimension.

18. A golf ball as defined in claim 17, wherein the particles of inorganic material consist essentially of clay.

19. A golf ball as defined in claim 18, wherein the clay is selected from the group consisting of hydrotalcite, montmorillonite, micafluoride, and octosilicate.

20. A golf ball as defined in 17, wherein:
the golf ball comprises a core; and

the core comprises nanofiller material.

21. A golf ball as defined in claim 20, wherein the core comprises about 0.1 to about 20 percent by weight nanofiller material.

22. A golf ball as defined in claim 21, wherein the core comprises about 0.1 to about 15 percent by weight nanofiller material.

23. A golf ball as defined in claim 22, wherein the core comprises about 0.1 to about 10 percent by weight nanofiller material.

24. A golf ball as defined in claim 17, wherein:
the golf ball comprises a core and a layer surrounding the core; and
the layer comprises nanofiller material.

25. A golf ball as defined in claim 24, wherein:
the golf ball comprises a cover layer on the surface of the golf ball,
and;
the cover layer comprises nanofiller material.

26. A golf ball as defined in claim 24, wherein:
the golf ball comprises a cover layer on the surface of the golf ball
and an intermediate layer or layers between the core and the cover layer; and
one or more of the intermediate layer or layers comprise nanofiller
material.

27. A golf ball as defined in claim 24, wherein the layer comprises about 0.1 to about 20 percent by weight nanofiller material.

28. A golf ball as defined in claim 27, wherein the layer comprises about 0.1 to about 15 percent by weight nanofiller material.

29. A golf ball as defined in claim 26, wherein the layer comprises about 0.1 to about 10 percent by weight nanocomposite material.

30. A golf ball as defined in claim 17, wherein:
the golf ball comprises a core, a layer of rubber thread encasing the core, and a cover layer encasing the layer of rubber thread; and
the core comprises nanocomposite material.

31. A golf ball as defined in claim 17 wherein:
the golf ball comprises a core, a layer of rubber thread encasing the core, and a cover layer encasing the layer of rubber thread; and
the cover layer comprises nanocomposite material.

32. A golf ball having a core or a layer surrounding the core comprising from about 10 to about 20 percent by weight of nanocomposite material, wherein the nanocomposite material comprises a polyamide in the structure of which phillosilicate particles are substantially evenly dispersed, wherein each phillosilicate particle has a largest dimension that is about one micron or less and that is at least an order of magnitude greater than such phillosilicate particle's smallest dimension.

33. A golf ball as defined in of claim 32, further comprising an amide block copolymer.

34. A golf ball as defined in claim 33, wherein the amide block copolymer is a polyether amide block copolymer.

35. A golf ball as defined in claim 32, further comprising a block copolymer, the block copolymer comprising:

a first polymer block comprising an aromatic vinyl compound;

a second polymer block comprising a conjugated diene compound;

and

a hydroxyl group located at a terminal block copolymer.

36. A golf ball as defined in claim 32, further comprising the hydrogenation product of a block copolymer, comprising:

a first polymer block comprising an aromatic vinyl compound;

a second polymer block comprising a conjugated diene compound;

and

a hydroxyl group located at a terminal block copolymer.

37. A golf ball comprising nanocomposite material and nanofiller material.

38. A method for making a composition for use in golf balls, comprising a step of blending into the composition a nanocomposite material, wherein the nanocomposite material comprises a polymer having a structure in which particles of inorganic material are reacted and substantially evenly dispersed,

- 5 wherein each particle has a largest dimension that is about one micron or less and that is at least an order of magnitude greater than such particle's smallest dimension.

- 39/ A method for making a composition for use in golf balls, comprising a step of blending into the composition a nanofiller material, wherein the nanofiller material comprises particles of inorganic material, wherein each particle has a largest dimension that is about one micron or less and that is at least an order of magnitude greater than such particle's smallest dimension
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